Food and Home Notes

UNITED STATES DEPARTMENT OF AGRICULTURE
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YOU'VE ASKED ABOUT

—— LOW-ACID TOMATOES

"Low-acid tomatoes" have been blamed for a small number of botulism incidents from home-canned tomato products in recent years. Actually, the cause of botulism from home canned tomatoes is not well understood yet -- in spite of past research.

CURRENT RESEARCH SHOWS...

Scientists have examined some home canned products associated with botulism outbreaks and have found them normal in acidity. Microbiologists have not been able to grow Clostridium botulinum, the organism that causes botulism, in tomatoes with pH below 4.8 A pH value as high as 4.8 is rarely found in tomatoes. (pH is a measure of acidity -- low pH means high acidity and high pH, low acidity.)

Scientist in the Northeastern Region of USDA's Agricultural Research Service (ARS), in Philadelphia, Pennsylvania, and at the National Canners Association, Berkeley, California, suspect other micro-organisms also might play a part. Some of these micro-organisms were present in one of the incriminated canned tomato products and may have reduced its acid content by their metabolic activities enough to permit C. botulinum to grow.

(con't)

LOW-ACID TOMATOES (con't)

The scientists also believe that the suspect jars were either inadequately heated or contaminated after heating via defective seals. Current research is testing this hypothesis.

SURVEY IDENTIFIES...

During the summer of 1975, ARS scientists in Philadelphia, Pennsylvania, and Beltsville, Maryland, surveyed 55 tomato varieties to identify low-acid types, and to assess their significance in relation to botulism. The pH of 5 to 18 individual fruits of each variety was measured. If a variety showed a tendency towards high pH, it was resampled.

The test data show that none of 55 varieties had a mean pH high enough to support the growth of C.botulinum. Individual fruits had pH values substantially higher than the mean, but none were high enough to support the growth of C.botulinum. Varieties tending toward higher pH were generally standard or pear-shaped types -- not white or yellow tomatoes.

Because numerous tomato varieties are available to home canners, it is impossible for any one laboratory to do a comprehensive survey of all varieties and all growing conditions. Therefore, the ARS scientists drew upon data from state experiment stations and other ARS laboratories that included more than 550 varieties and breeding lines.

"LOW-ACID"VARIETIES

The ARS scientists believe seed catalog descriptions may have contributed to misinformation about tomato acidity. Certain varieties are described as being "nonacid," or "most acid free." These descriptions are usually based on taste, which reflects the balance between sugar and acid --rather than on measurments of pH or acid content. It may also be slanted to appeal to persons who believe such acids to be injurious to their health.

(con't)

LOW-ACID TOMATOES (con't)

It is important to note that the cherry, patio and light colored tomatoes, generally considered to be "low acid" by the public, are relatively high in acid compared to other tomato types. On the other hand, the ARS scientists found that the pear and elongated tomatoes tend to be lower in acid. These tomatoes, usually grown for mechanical harvesting, are used primarily for processing and are normally acidified by the processor. Since the pH of standard tomatoes varies over such a wide range, it is impossible to make generalized statements about their suitability for home canning.

...ON NEW VARIETIES

New varieties can not be blamed for any low acidity problem, the ARS scientists said. There has been little or no change in the mean pH of tomato varieties introduced over the last two decades. Older varieties are only slightly more acid. The pH of ARS-developed breeding lines is carefully considered before they are introduced as new varieties.

...WATCH THE OVERRIPE

Tomato acidity may decrease when the fruit becomes overripe. Data obtained at Michigan State and Oregon State Universities show that the pH of overripe tomatoes can reach the low-acid range. In some cases, it might permit C. botulinum to grow. Overripe tomatoes (those that are too soft) of any variety should not be canned. Also, those that show any decay or mold should not be canned.

TO BE CONTINUED...

The ARS scientists will continue their studies this summer. They will continue to evaluate experiment station data and measure tomato pH to identify varieties, locations and other factors which may produce low-acid tomatoes.

(con't)

LOW-ACID TOMATOES (con't)

They are also testing the benefits of adding commonly available edible acids to home canned tomatoes.

Stoop labor in picking tomatoes was costly and time consuming.

IMPORTANT TIPS

These are the most important tips for the home canner to follow: 1) select tomatoes which are not overripe; 2) follow the recommendations of reliable canning guides explicitly; 3) destroy (without tasting) any home canned product which looks or smells abnormal in any way.

Mechanical harvesting cuts labor costs and increases production and quality of tomatoes for canning.

New tomato varieties such as this NOVA variety was developed in New York

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The U.S. Department of Agriculture recommends that home canners carefully follow instructions in Home and Garden Bulletin No.8, "Home Canning of Fruits and Vegetables." It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price per copy is 45 cents.

USDA researcher at Washington State is seeking new varieties resistant to deseases of Western deserts.

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